FIG. 1

FIG. 2

EXTENDED INDEX | RECORD ARRAY

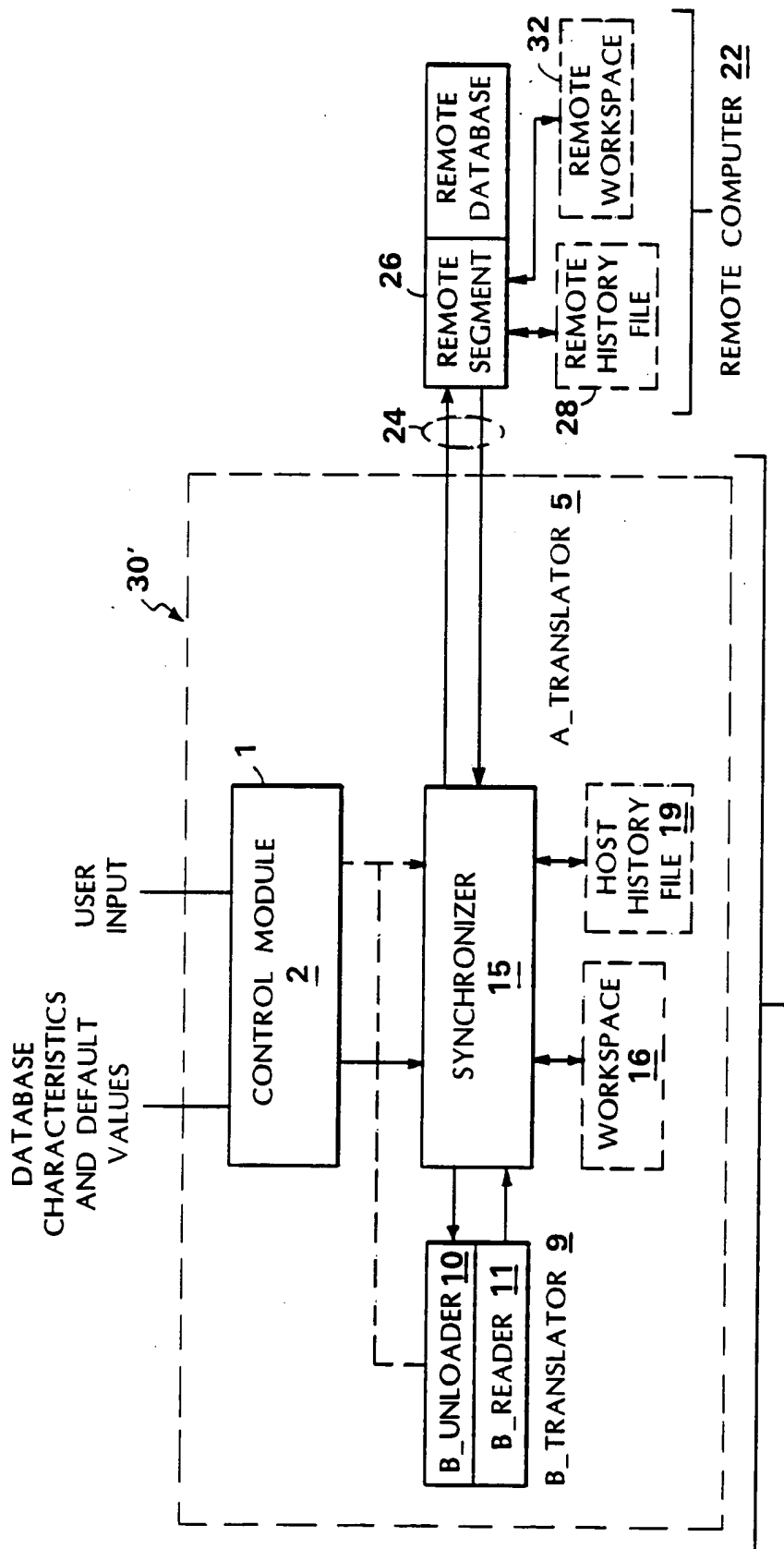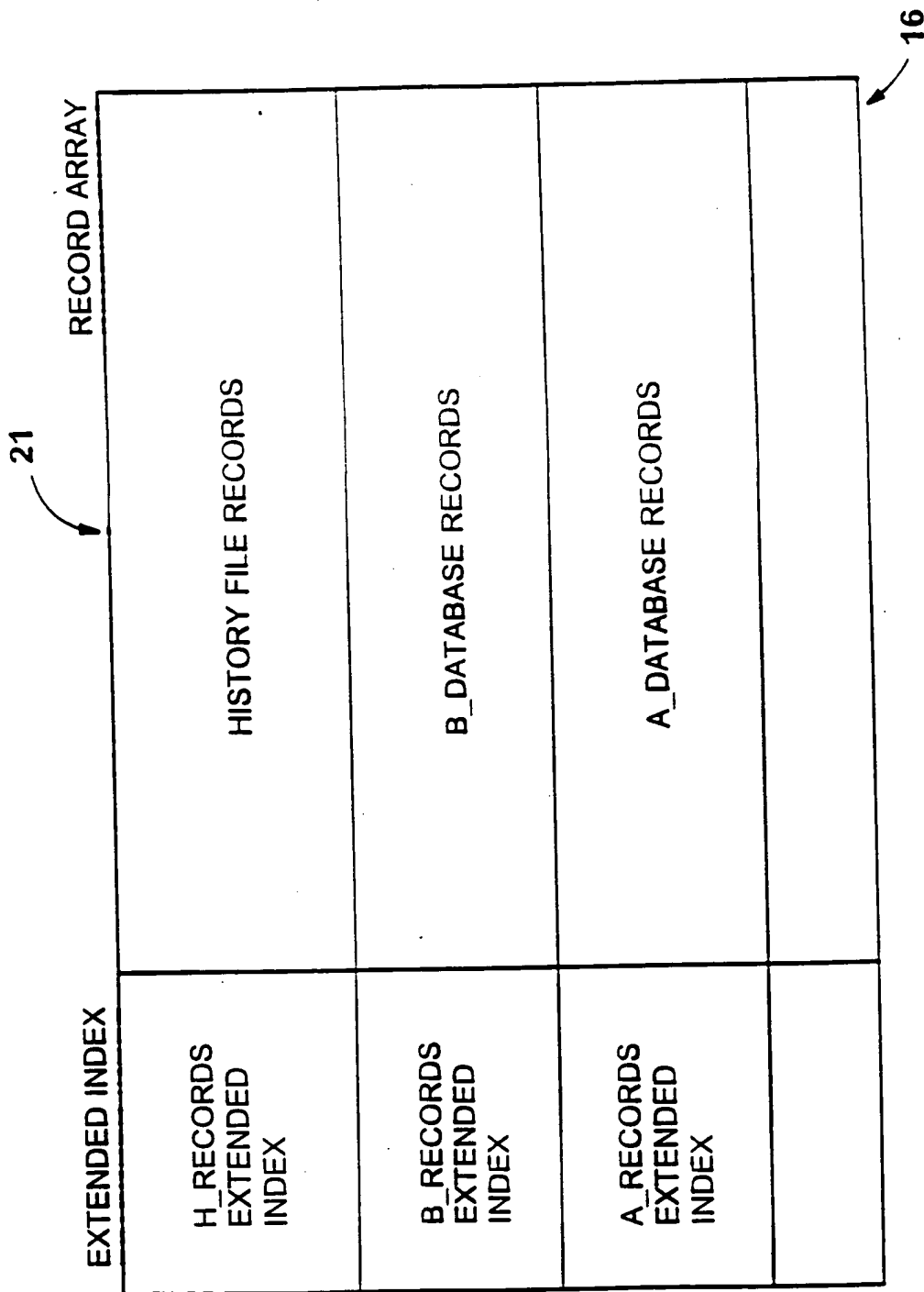| H_RECORDS EXTENDED INDEX | HISTORY FILE RECORDS |
B_RECORDS EXTENDED INDEX	B_DATABASE RECORDS
A_RECORDS EXTENDED INDEX	A_DATABASE RECORDS

21

16

FIG. 3

401. INSTRUCT the synchronizer to initialize itself, specifying current user options

402. INSTRUCT the synchronizer to load the appropriate history file into its workspace

403. INSTRUCT host Translator to LOAD all of host Records from host Database

404. INSTRUCT RemoteTranslator to LOAD all of Remote Records from Remote Database --

405. INSTRUCT Synchronizer to perform (CAAR) on all the history, B records, and A records in the workspace.

406. INFORM user exactly what changes are about to be made

407. If user inputs NO, THEN ABORT

408. INSTRUCT host Translator to UNLOAD all applicable changes to host Database.

409. INSTRUCT Remote Translator to UNLOAD all applicable changes to Remote Database.

410. INSTRUCT Synchronizer to CREATE a new history file.

FIG. 4

501.   INITIALIZE an empty remote workspace
502.   IF there is a remote history file matching the host history file name
503.   IF the remote history file time stamp matches the history file time stamp
504.   LOAD the remote history file into the remote workspace
505.   ELSE
506.   REMOVE the non-matching history file
507.   Proceed with the empty workspace, all records passed to host
508.   ENDIF
509.   ELSE
510.   Proceed with the empty workspace, all records passed to host
511.   ENDIF
512.   FOR each record in the remote database
513.   Translate and load data field values and unique ID into remote workspace
514.   Compute a hash value to represent all translated data values
515.   IF the unique ID matches the unique ID of an existing remote history file entry,
516.   IF the hash value is the same
517.   Skip this entry, the host will recreate this record from history
518.   ELSE
519.   Send Unique ID, field values and "Changed" record flag to the host
520.   Create new workspace entry with same unique ID and new hash value
521.   This new entry is marked as "unacknowledged"
522.   ENDIF
523.   ELSE
524.   Send Unique ID, field values and "Added" record flag to the host
525.   Create new workspace entry with new unique ID and new hash value
526.   This new entry is marked as "unacknowledged"
527.   ENDIF
528.   NEXT
529.   FOR each unique ID in the remote history file not matched in the above loop,
530.   Send Unique ID and "Deleted" flag to the host
531.   NEXT
532.   WAIT for host to synchronize the data and for user to confirm results
533.   IF user has aborted the synchronization
534.   The remote workspace is discarded.
535.   The original remote history file remains unmodified.
536.   The process is terminated.
537.   ENDIF
538.   FOR each record "action" or "acknowledgment" received from the host,
539.   IF this is an acknowledgment of a record Added or Updated in the remote database,
540.   Mark any corresponding, newly created workspace item as "acknowledged"
541.   Remove any prior workspace item with the same unique ID
542.   ELSE IF this is a new action to Add, Update, or Delete a remote database record
543.   UPDATE remote workspace to reflect the appropriate change
544.   Mark any corresponding, newly created workspace item as "acknowledged"
545.   Remove any prior workspace item with the same unique ID
546.   IF this is an Add
547.   SEND the new unique ID back to the host to include in history file
548.   ENDIF
549.   ENDIF
550.   NEXT
551.   REMOVE any newly create, but "unacknowledged" entries from the workspace
552.   UPDATE the remote history file from the remote workspace

FIG. 5

Recreation of "filtered" data by the synchronizer using history data when unique ID's are present.

601.   FOR all Added, Changed, and Deleted records transmitted from the remote ,

602.   IF record was flagged "Added"

603.   Add the new record to the workspace, not correlated with any history at this time

604.   ELSE IF record has been changed

605.   Find corresponding history item in the workspace by the changed record's Unique ID

606.   Associate (link) the changed record with this workspace item

607.   ELSE IF record has been deleted

608.   Find corresponding history item in the workspace by the deleted record's Unique ID

609.   Associate (link) the delete action with this workspace item

610.   ENDIF

611.   NEXT

612.   FOR all history records not yet matched by a remote Unique ID,

613.   CLONE the missing record data and Unique ID from data in the history file

614.   NEXT

Updating the remote computer's remote history file while unloading changes from the workspace to the remote database (when unique ID's are used):

615.   FOR all actions or acknowledgments recorded in the workspace for the remote database

616.   SEND all actions with associated record data to the remote

617.   SEND all acknowledgments to the remote with associated unique ID's

618.   UPDATE workspace with unique ID's sent from the remote as the result "Add" actions.

619.   NEXT

FIG. 6

701. INITIALIZE an empty remote workspace
702. IF there is a remote history file matching the host history file name
703.   IF the remote history file time stamp matches the history file time stamp
704.   LOAD the remote history file into the remote workspace
705.   ELSE
706.   REMOVE the non-matching history file
707.   Proceed with the empty workspace, all records passed to host
708.   ENDIF
709. ELSE
710.   Proceed with the empty workspace, all records passed to host
711. ENDIF
712. FOR each record in the remote database,
713.   Translate and load data field values into the remote workspace
714.   Compute a hash value to represent all translated data values
715.   IF the hash value matches the hash value of one or more remote history file entries,
716.   Send hash value, remote workspace index, and "Unchanged" record flag to the host
717.   ELSE
718.   Create new workspace entry with new new hash value and remote workspace index
719.   This new entry is marked as "unacknowledged"
720.   Send hash value, remote workspace index, field values and "Added" record flag to the host
721.   ENDIF
722. NEXT
723. REMOVE any "prior" workspace entries not matched by hash value above
724. WAIT for host to synchronize the data and for user to confirm results
725. IF user has aborted the synchronization
726.   The remote workspace is discarded.
727.   The original remote history file remains unmodified.
728.   The process is terminated.
729. ENDIF
730. FOR each record "action" or "acknowledgment" received from the host,
731.   IF this is an acknowledgment of a record sent to the host (above) as "added",
732.   Mark any corresponding, newly created workspace item as "acknowledged"
733.   ELSE IF this is a new action to Add, Update, or Delete a remote database record
734.   UPDATE remote workspace to reflect the appropriate change
735.   Mark the updated record as "acknowledged"
736.   ENDIF
737. NEXT
738. REMOVE any newly create, but "unacknowledged" entries from the workspace
       UPDATE the remote history file from the remote workspace

FIG. 7

Recreation of "filtered" data by the synchronizer using history data when unique ID's are **not** present.

801.   FOR all Added records transmitted from the remote ,
802.   Add the new record to the workspace, not correlated with any history at this time
803.   NEXT
804.   FOR all Unchanged items transmitted from the remote ,
805.   Find corresponding history item in the workspace by the unchaged record's hash value
806.   CLONE the missing record data from data in the history file
807.   NEXT

Updating the remote computer's remote history file while unloading changes from the workspace to the remote database (when unique ID's are not used):

808.   FOR all actions or acknowledgments recorded in the workspace for the remote database
809.   SEND all actions with associated record data to the remote
810.   SEND all acknowledgments to the remote with associated remote workspace indexes
811.   NEXT

FIG. 8